Notice of Allowability	Application No.	Applicant(s)	
	09/473,569	DAHN ET AL.	
	Examiner	Art Unit	
	Anjan K Deb	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed 02/04/2004*.

2. ☒ The allowed claim(s) is/are *1-70*.

3. ☒ The drawings filed on *02/04/04 (Fig. 1) 12/29/99 (Fig. 2-19)* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Anjan K Deb
Primary Examiner
Art Unit: 2858

DETAILED ACTION

1. This office action is in response to amendment filed 02/04/2004.

Allowable Subject Matter

2. Claims 1-70 are allowed.

Reasons for Allowance

3. The following is an examiner's statement of reasons for allowance:

The primary reason for allowance of the claims 1-10 is the inclusion of developing a power function for the sample using the self-heating, power-temperature or power-time data, the power function representative of thermal power per unit mass of the sample as a function of temperature and amount of reactant remaining from a reaction of the electrode material and electrolyte of the sample.

The primary reason for allowance of the claims 11-18 is the inclusion of developing a first power function for the first sample and a second power function for the second sample using the first and second self-heating, power- temperature or power-time data, respectively, the first power function characterizing a reaction between the cathode material and the electrolyte in terms of thermal power per unit mass of the cathode sample material, and the second power

function characterizing a reaction between the anode material and the electrolyte in terms of thermal power per unit mass of the anode sample material.

The primary reason for allowance of the claims 32-40 is the inclusion of memory, coupled to the processor, that stores a cathode power function characterizing a reaction between a cathode and an electrolyte in terms of thermal power per unit mass of cathode material and further stores an anode power function characterizing a reaction between an anode and the electrolyte in terms of thermal power per unit mass of anode material, the processor computing a response of an electrochemical cell to a specified operating condition using the cathode and anode power functions and the physical parameters of the electrochemical cell.

The primary reason for allowance of the claims 19-31, 41-70 is the inclusion of predicting, using the first and second power functions and the physical parameters of the electrochemical cell, a response of the cell to a specified operating condition.

Pertinent Art

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

LaForge (US 5,012,176) discloses a method of characterizing electrochemical cell (battery charge) by developing a power function using power-temperature model (column 5 lines 1-60). LaForge does not explicitly disclose power function is representative of thermal power per

unit mass of the sample as a function of temperature and amount of reactant remaining from a reaction of the electrode material and electrolyte of the sample.

Vaidyanathan, H. and Rao, G., ("**Electrical and thermal characteristics of lithium-ion cells",** Battery Conference on Applications and Advances, 1999. The Fourteenth Annual, 12-15 Jan. 1999 Pages:79 – 84) discloses power function (see thermal-model, equation 5) of lithium-ion cells using calorimeter. Vaidyanathan, H. and Rao, G., does not explicitly disclose power function is representative of thermal power per unit mass of the sample as a function of temperature and amount of reactant remaining from a reaction of the electrode material and electrolyte of the sample.

Roth E. P. ("Thermal characterization of Li-On cells using calorimetric techniques," Energy Conversion Engineering Conference and Exhibit, 2000 (IECEC) 35th Intersociety, Volume 2, 24-28 July 2000, Pages 962-967 vol. 2) present Lithium-ion cell experimental data relating power- temperature of anode and cathodes disposed in electrolyte (Fig. 3-6). Roth E. P. does not explicitly disclose developing a power function, which is representative of thermal power per unit mass of the sample as a function of temperature and amount of reactant remaining from a reaction of the electrode material and electrolyte of the sample.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is (571)-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le, can be reached at (571)272-2233.

Anjan K. Deb
Patent Examiner
Art Unit: 2858
5/7/04

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